

furrow remaining perpendicular, one convolution exceeds the other in height, and the cortex becomes uneven, or the cortex remaining smooth, the furrow assumes an oblique direction, and one convolution overtops the other, (formation of opercula). The latter process, as well as the union or non-union of separate furrows, give rise to the variations in the species or individuals.

VIII. A subsequent disappearance of existing furrows occurs but rarely, (and never after the fifth month).

On the strength of these theorems, the author insists on the following methods in the study of the brain:

1. The study of the cerebral convolutions must be accompanied by a consideration of their development. Especially is this requisite in the classification of the cortex. Where fetal brains are not to be had, the study of the depth of the furrows can take their place.

2. The furrows and their depth are the first and most important object of every research and description. The primary and secondary convolutions thus come to be considered naturally as divisions of the cortex, limited and separated by primary, secondary or tertiary furrows. Deceptions due to the external superficial appearance of convolutions should be avoided.

3. Geometrical drawings ought to be made in large numbers. If they include the four sides of the specimen, they are a perfect substitute for the original. Artistic shading is not only superfluous, but even harmful; the depth, however, of the furrows ought to be a part of the drawing.

4. The next problem ought to be extended observations on the position, shape, and depth of the primary furrows. Only when this has been completed can the detailed investigation of the less constant secondary furrows and convolutions be of use.

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THE MOTOR CENTRES FOR THE MEMBERS.—At the session of the Acad. de Médecine, Paris, Oct. 23 (reported in *Le Progrès Médical*). M. Bourdon read a paper entitled, "Clinical Researches on the Motor Centres for the Members." M. Gosselin, in his report on the memoirs of M. M. Lucas. Champonniere, Proust and Terrillon, having raised the question of cerebral localization, M. Bourdon undertook some investigations on the subject, with the idea of testing by clinical observations the results of experiments made upon animals; his study was directed especially to the motor centres for the limbs. Having observed a very clear and precise case of brachial monoplegia, he compared it with all others as apparently conclusive to him, many of the cases never having been published.

He cited first his observation, reported by M. Darrolles, *internes* of the hospitals. An old man, of a very much deteriorated constitution, after a simple attack of vertigo, was suddenly affected with paralysis limited to the muscles of the forearm and hand of the right side, with preservation of the sensibility. Speech was quickly recovered; but the partial paralysis of the superior member persisted until death. At the autopsy,

there was found a very superficial small hemorrhagic *foyer* in the upper part of the ascending frontal convolution of the left hemisphere, and in the vicinity no lesion of the opto-striated bodies. In a second case, also unpublished, communicated by M. Verneuil, a mason, following a fall which produced a fracture of the skull, presented a paralysis of both arms, and at the autopsy there were found two *foyers* of meningo-encephalitis; one on the upper third of the left ascending frontal convolution, and the other on the right ascending parietal convolution. The author next reported a dozen observations of brachial monoplegia, described by different writers, and all accompanied with autopsies. In analyzing the nervous symptoms presented by the patients, there are found special characteristics of paralysis of cortical origin: disassociation, progressive march, successive appearance, instability of the paralytic phenomena, these always leaving the sensibility uninvolved, and almost never being accompanied with loss of consciousness. As to the very various anatomical lesions, they were all located in the cortical motor region, but instead of occupying the upper third of the ascending frontal convolution of the superior two-thirds of the ascending parietal, that is, in the circumscribed region in which MM. Carville and Duret have located the motor centre for the arm in man, from their experiments upon animals; and in place of being situated on the middle third of the ascending frontal, as it should be, according to the localization proposed by MM. Charcot and Pitres in their recent memoir, these lesions were disseminated over the whole height of the two ascending convolutions and in their neighborhood. But, and this point is worthy of note, whenever there was paralysis of the face with that of the arms (six observations) a lesion existed in the middle or lower part of the ascending frontal convolution, that is, more or less near the second frontal convolution where is generally accorded the motor centre for the face. The region occupied by all these lesions, although rather extensive, appeared to constitute the true motor centre for the arm; only in getting these observations of cortical hemiplegia, M. Bourdon recognized that in the majority of cases, the anatomical alteration occupied the superior third of the ascending frontal, and the upper two-thirds of the ascending parietal convolutions, conformably to the localization adopted by MM. Charcot and Pitres, for the combined movements of the leg and arm; but in a good number of cases, the autopsy revealed lesions having the same locality in cases of only brachial monoplegia. The author then engages in the investigations whether, independently of its situation, certain characters of the anatomical alterations may not account for this difference in the paralytic phenomena. Contrary to what might be supposed, the facts did not show to him that the extension of the paralysis from the arm to the leg, had any relation with any increase of extent of the lesion either in surface or depth.

The study of brachial monoplegias not having given as satisfactory a result as he had expected, M. Bourdon sought to see whether amputations of the arm, with their necessarily very simple encephalic lesion, would not be better suited than cerebral affections to reveal the exact situation of the motor centres. If it be true, as from certain facts of arrest of devel-

opment we might be led to think, that the default of action of a member causes, after a while, an atrophy of that part of the brain which controls its movements, the author ought to be able to find in cases of old amputations, an atrophic lesion of the surface of the brain always occupying the same point. Unfortunately he was able to collect but two observations followed by autopsies; one by M. Chuquet, and the other by M. H. C. de Boyer, both *internes* of the hospitals.

Nevertheless in these cases there was found an atrophy occupying the upper part of the two ascending convolutions, that is to say, over a portion of the region occupied by the lesions of brachial monoplegia, and this augments the value of those lesions as regards localizations. In a second chapter M. Bourdon treats of the movements of the lower limbs for the purpose of finding whether in man there really exists a motor centre distinct from that for the arm, as experiments upon animals permit us to suppose to be the case; and he seeks to support this supposition by clinical facts of paralysis limited to one limb. But those recorded in the books are either not accompanied with the accounts of the autopsies or the location of the lesion is barely indicated. In lack of sufficiently conclusive cases of monoplegia, the author has collected three cases of amputation, and one of arrest of development of the lower limb. In the three first, observed by M. Luys, there was found an atrophy located in the upper part of the ascending frontal convolution; in the case of arrest of development, published by M. Landouzy, the atrophy occupied the upper portion of the ascending parietal convolution.

After giving his conclusions, readily deduced from the preceding facts, M. Bourdon closes with the following practical considerations. In consequence of the considerable extent of the motor centre for the arm, a paralysis limited to this member does not indicate with sufficient precision the part of the cranium to which the trephine should be applied. Nevertheless, if there is added to the brachial monoplegia a paralysis of the lower face, or an aphasia, we have, according to M. Bourdon, a great chance of meeting the lesion by operating over the middle portion of the Rolandian line, as recommended by M. Lucas-Champonniere. As to the counsel given by that surgeon, to apply the trephine near the summit of the fissure of Rolando, in case of paralysis of the lower member, the observations cited tend to prove that it is well founded, but the case is otherwise when he advises operation behind the fissure, since the facts demonstrate that the anatomical alteration is more often anterior than posterior to the line which serves as a landmark for the surgeon.

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THE REAL ORIGIN OF THE FACIAL.—At the session of the Soc. de Biologie Oct. 20, (rep. in *Le Progres Médical*) M. Duval communicated the results of his investigations as to the true point of origin of the facial nerve. In sections perpendicular to the axis of the medulla we trace the course of this nerve, beginning at its point of emergence, back toward the posterior extremity of the raphe; from there pass fibres which take a recurrent course towards a nucleus, the true nucleus of origin of the facial.